PROCESS FOR THE FORMATION OF POLYHEDRAL OLIGOMERIC SILSESQUIOXANES

Patent number:	WO0110871
Publication date:	2001-02-15
Inventor:	LICHTENHAN JOSEPH D; SCHWAB JOSEPH J; REINERTH WILLIAM; CARR MICHAEL J; AN YI-ZONG; FEHER FRANK J; TERROBA RACHEL
Applicant:	HYBRID PLASTICS [US]
Classification:	
- international:	C07F7/08; C08G77/06
- european:	C07F7/08D4K2; C07F7/21; C08G77/38
Application number:	WO2000US21455 20000803
Priority number(s):	US19990147435P 19990804

Cited documents:

US5484867
US5942638
US6100417

Abstract of **WO0110871**

Three processes for the manufacture of polyhedral oligomeric silsesquioxanes (POSS) which utilize the action of bases that are capable of either attacking silicon or any compound that can react with a protic solvent (e.g. ROH, H2O etc.) and generate hydroxide [OH]<->; alkoxide [RO]<->, etc. The first process utilizes such bases to effectively redistribute the silicon-oxygen frameworks in polymeric silsesquioxanes [RSiO1.5] INFINITY where INFINITY =1-1,000,000 or higher into POSS nanostructures of formulas [(RSiO1.5)n] SIGMA #, homoleptic, [(RXSiO1.5)n] SIGMA #, functionalized homoleptic, [(RSiO1.5)m (R'SiO1.5)n] SIGMA #, heteroleptic, and {(RSiO1.5)m(RXSiO1.0)n} SIGMA #, functionalized heteroleptic nanostructures. The second process utilizes base to aid in the formation of POSS nanostructures of formulas [(RSiO1.5)n] SIGMA #, homoleptic and [(RSiO1.5)m(R'SiO1.5)n] SIGMA #, heteroleptic and [(RSiO1.5)m(RXSiO1.0)n] SIGMA #, functionalized heteroleptic nanostructures from silanes RSiX3 and linear or cyclic silsesquioxanes of the formula RX2Si-(OSiRX)m-OSiRX2 where m=0-10, X=OH, Cl, Br, I, alkoxide OR, acetate OOCR, peroxide OOR, amine NR2, isocyanate NCO, and R. The third process utilizes base to selectively ring-open the silicon-oxygen-silicon (Si-O-Si) bonds in POSS structures to form POSS species with incompletely condensed nanostructures. These proceses also afford stereochemical control over X. The three processes result in new POSS species that can undergo additional chemical manipulations to ultimately be converted into POSS-species suitable for polymerization, grafting, or other desirable chemical reactions.